

WHITEHALL
ELECTRIC UTILITY

WISCONSIN PUBLIC SERVICE

FEB 28 5 17 PM

6490

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Whitehall, WI 54773

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January 30, 2001

Jim Loock, Chief Electric Engineer
Public Service Commission
610 N. Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

RE: In the Matter of Filing Plans for Appropriate Inspection and
Maintenance, PSC Rule 113.0607.

Dear Mr. Loock:

Enclosed for filing are 3 copies of WHITEHALL ELECTRIC UTILITY's Preventative Maintenance Plan detailing inspection maintenance schedules, condition rating criteria, corrective action schedules, record keeping procedures and report filing schedules as documented in this rule.

Very truly yours,

Gary Fromm

Gary Fromm
Superintendent

Enclosures

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FEB 05 2001

Electric Division

PREVENTATIVE MAINTENANCE PLAN

WHITEHALL ELECTRIC UTILITY

FILING DEADLINE

FEBRUARY 1, 2001

January 30, 2001

Gary Fromm

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Whitehall, Wi. 54773

715-538-4353

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Electric Division

This plan was prepared by the MEUW work group for PSC Rule 113.0607 for use by the 82 municipal electric utilities in Wisconsin and endorsed by PSC staff as meeting the requirements of Rule PSC 113.0607.

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SCHEDULE:	MONTHLY	ANNUAL	EVERY 5 YEARS
Transmission ($\geq 69\text{Kv}$ and above)		X	X
Substations	X	X	
Distribution (OH & UG)			X

The inspection of Distribution facilities will be by individual substation circuits on a 5-year cycle such that the entire system will be inspected every 5 years. Inspector instructions for inspecting all facilities and forms are included with the plan.

METHODS: Five criteria groups will be used to complete the inspection of all facilities.

1. IR – infrared thermography used to find poor electrical connections and/or oil flow problems in equipment.
2. RFI - Radio Frequency Interference, a byproduct of loose hardware and connections, is checked using an AM radio receiver.
3. SI – structural integrity of all supporting hardware including poles, crossarms, insulators, structures, bases, foundations, buildings, etc.
4. Clearance – refers to proper spacing of conductors from objects, trees and other utility cables.
5. EC – equipment condition on non-structural components such as circuit breakers, transformers, regulators, reclosers, relays, batteries, capacitors, etc.

VII DISTRIBUTION – OVERHEAD INSPECTION GUIDE

STRUCTURE

- Pole Condition
- Pole Leaning
- Crossarm Condition
- Insulators, Deadend, Pin
- Excess Fill or Soil Removal
- Pole Steps
- Grounds Intact
- Ground Molding
- Down Guys
- Guy Markers
- Guy Bonding/Insulator
- Signage - Location Number, Warning Sign
- Customer Equipment
- Conductor
- Tie Wires
- U Guard/Conduit Condition

EQUIPMENT

- Transformers
 - ✓ Oil Leaks
 - ✓ Bushing Condition
 - ✓ Grounding/Bonding
- Capacitors
 - ✓ Fuses Blown
 - ✓ Bushing Condition
 - ✓ Oil Leaks
 - ✓ Tank Bulged
 - ✓ Switches, Oil, Vacuum
 - ✓ Control Conduit/Wiring
 - ✓ Grounding/Bonding
- Switches - GOAB, Inline, Disconnect
 - ✓ Insulator Condition
 - ✓ Operating Handle/Locks
 - ✓ Linkage
 - ✓ Grounding/Bonding
 - ✓ Switch Number
- Cutouts
 - ✓ Insulator Condition
 - ✓ Fuse Size Tag

OVERHEAD DISTRIBUTION INSPECTION FORM

Date _____ Inspected by _____ Sub _____ Ckt _____

Ckt

MAP AREA	STRUCTURE	EQUIPMENT	CLEARANCE	COMMENTS	Date Item Corrected	Corrected By
LOCATION	Pole Condition/Leaning			Rating Criteria 0) Good Condition 1) Good Condition but aging 2) Non-critical Maintenance Required 3) Priority Maintenance Required 4) Urgent Maintenance Required		
	Crossarm Condition					
	Insulators, DE, Pin					
	Soil Conditions					
	Pole Steps					
	Grounds Intact, Molding					
	Down Guys and Markers					
	Guy Bond, Insulator					
	Signs, Loc#, Warning					
	Customer Equipment					
	Conductor and Ties					
	U'Guard/Conduit Cond					
	RFI Check					
	Transformer					
	Switches					
	Cutouts					
	Arresters					
	Terminators					
	Street Light					
	Tree Trimming					
	Ground Line Clearances					
	Building Clearances					
	Streets, Roads, Alleys					
	Communication Clearance					

IX SUBSTATION - MONTHLY INSPECTION GUIDE (con't)

FEEDER CIRCUIT BREAKERS / RECLOSERS

- OPEN/CLOSED indicator
- CHARGED/DISCHARGED indicator
- Cabinet light
- Cabinet heater
- Operations counter
- Bushings and supports
 - ✓ Cracks or chips
 - ✓ Rust or dirt
- Line and load side disconnect switches
 - ✓ Labeled properly
 - ✓ Aligned properly
 - ✓ Handles grounded
- Emergency trip button
- Oil level gauge
- Tank oil leaks
- Reset switch
- Cabinet contamination
- Vents clean
- Gas pressures for GCBs

HIGH AND LOW VOLTAGE BUSS WORK:

- Bushing, insulator, arrestor, and support insulators
 - ✓ Chips or cracks
 - ✓ Rust or dirt
- Bird nests
- Potential transformers bushings
 - ✓ Cracks or chips
 - ✓ Rust or dirt
- Cable terminators
 - ✓ Leaking fluid
 - ✓ Cracks or chips

MANUAL SWITCHES:

- Properly labeled
- Ground connections
- Positioning and alignment
- Bushing and support insulators
 - ✓ Cracks or chips
 - ✓ Rust or dirt

MOTOR OPERATED SWITCHES:

- OPEN/CLOSED indicator
- Properly labeled
- Cabinet heater
- Operations counter

MONTHLY SUBSTATION INSPECTION FORM

INSPECTED BY: _____

DATE: _____

SUBSTATION: _____

TRANSFORMER MAIN TANK

RATING: 0 1 2 3 4 (Circle One)

inspected	X	COMMENTS	DATE CORRECTED	CORRECTED BY
Oil in Bushings				
Bushing and Arrestor				
Oil Leaks				
Main Tank				
Sample Valves				
Radiators				
Radiator Bank				
Tank Pressure				
Tank Oil Level				
Temperature Gauge				
Cooling Fans				

TRANSFORMER LTC or VOLTAGE REGULATORS

RATING: 0 1 2 3 4 (Circle One)

Tank Oil Level				
Drag Hand Positions				
Cabinet Light				
Operation Count				
Tank Pressure				
Cabinet Heater				
Cabinet Contamination				

MONTHLY SUBSTATION INSPECTION FORM

INSPECTED BY:

DATE:

SUBSTATION:

FEEDER CIRCUIT BREAKER / RECLOSER

RATING: 0 1 2 3 4 (Circle One)

[illegible]

MONTHLY SUBSTATION INSPECTION FORM

INSPECTED BY: _____

DATE: _____

SUBSTATION: _____

CONTROL HOUSE/MISCELLANEOUS

RATING: 0 1 2 3 4 (Circle One)

inspected	X	COMMENTS	DATE CORRECTED	CORRECTED BY
Clock Displays Proper Time				
AC/DC Load Center Breakers				
Room Temperature				
Rodents				
Panels Labeled Properly				
Panel Lights				
Annunciator Panel				
Panel Meters				
SCADA System RTU				
SCADA Alarms				
Position Indicators Agree				
Relay Target Information				
Emergency Contact Directory & Dialtone for Phone				
Safety Equipment				

BATTERY

RATING: 0 1 2 3 4 (Circle One)

Liquid Levels				
Proper Float Voltage on Charger & Battery				
Specific Gravity in Pilot Cell				
Personal Protective Equipment				
Connection Corrosion				
Leaking Cells				
Dated Solution in Eyewash Station				

YARD & FENCE

RATING: 0 1 2 3 4 (Circle One)

Fire Extinguisher Charged				
Fence Ground Connections				
Fence Secured				
Security and Emergency Lights				
Site Base and Grade				
Standing Water				
Warning Signs				

ANNUAL SUBSTATION INSPECTION FORM

Date _____ Inspected by _____ Substation _____

EQUIPMENT LISTING	SUBSTATION INSPECTION CRITERIA								COMMENTS	MAINTENANCE COMPLETED	
	Check equipment for level	Check condition of concrete pads	Perform oil and DGA analysis	Battery checks - Intercell strap resistance, Individual cell voltages, Cell specific gravity	Nameplate legible	Equipment paint condition	Proper identification labels	IR / RFI scans and checks		Date Item Corrected	Corrected By
Transformer											
LTC or regulators											
High Voltage Breaker											
Feeder CBs / Reclosers											
Switches											
Control house battery											
Transmission line RFI											

XI TRANSMISSION – ANNUAL INSPECTION GUIDE (con't)

RFI CHECK

- Splices
- Connectors
- Dead Ends
- Switches
- Structures

XII TRANSMISSION – 5 YEAR INSPECTION GUIDE

IR SCAN

- Splices
- Connectors
- Dead Ends
- Switches